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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,561	12/05/2001	Yin-Ming Li	1797-0160001	3573

7590 05/18/2005

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EXAMINER

IBRAHIM, MEDINA AHMED

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/856,561	<b>Applicant(s)</b> LI ET AL.	
	<b>Examiner</b> Medina A. Ibrahim	<b>Art Unit</b> 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6, 10, 14 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6, 10, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

*B*

### DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Applicant's response filed 02/18/05 in reply to the Office action of 09/14/04 has been entered. Claims 6, 10, and 14-15 are pending and are examined.

All previous objections and rejections not set forth below have been withdrawn in view of the response of 02/18/05.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 6 and 10 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of recovering cadmium and zinc of about 1800 mg/Kg and about 18, 000 mg/kg, respectively in shoot from arable soil contaminated with said metals by cultivating in said soil at least one *Thlaspi caerulescense* of the genotype G15, does not reasonably provide enablement for a method that recovers about 6000 mg/kg of Cd and about 30, 000 mg/kg of Zn with said *Thlaspi caerulescense* of the genotype G15, and said plant having the ability to accumulate as high as 6000 mg/kg of cadmium and 30, 000 mg/kg of zinc. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

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The claims are drawn a method of recovering cadmium and/or zinc from contaminated arable soil by cultivating at least one *Thlaspi caerulescense* of the genotype G15, wherein the plant accumulates up to 6000 mg/kg of cadmium and up to 30,000 mg/kg of zinc (dry wt) in the above ground tissues, and recovering the accumulated cadmium and zinc. The claims are also drawn to an isolated *Thlaspi caerulescense* of the genotype G15.

Applicant has provided guidance for the isolated plant and seed of the *Thlaspi caerulescens* G15 genotype, the seed deposited under the accession no. 20349, and a method for using said *Thlaspi caerulescens* G15 plants to recover Cd and Zn from Cd/Zn contaminated soil. The *T. caerulescens* G15 genotype plants were grown hydroponically on a nutrient solution containing various concentrations of Cd and Zn with citric acid and was shown to accumulate up to 1800 mg/kg of Cd and up to 18,000 mg/kg of Zn in the aboveground tissues on dry wt basis (Figs. 1 and 2), without any damage to the plant. Applicant has not provided guidance for a method that allows the disclosed *Thlaspi caerulescens* G15 plants to accumulate up to 6000 mg/kg of cadmium and up to 30, 000 mg/kg of zinc. Since the state of the art as evidenced by Salt et al (Biotechnology, vol. 13, pp. 468-474, 1995, Applicant's IDS) teaches that the ability of a plant to accumulate heavy metals is a genotype dependent (page 469, column 2, Phytoextraction), it is unpredictable as to whether the accumulating ability of the disclosed genotype can be improved since G15 has shown to accumulate only up to 1800 mg/kg. Therefore, absent evidence to the contrary one skilled in the art would not

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be able to use the *T. caerulescens* to extract as high as 6000 mg/kg of Cd and up to 30,000 mg/kg of Zn, without undue experimentation.

Therefore, given the lack of guidance in Applicants' specification regarding the disclosed *Thlaspi caerulescens* G15 plants having the metal accumulating property as recited in the claims, and the state of the art, the claimed invention is not enabled throughout the broad scope.

Applicant is invited to provide evidence in the form of data or 132 declaration stating the G15 plants are expected to accumulate as high as 6000 mg/kg of Cd and 30,000 mg/kg of Zn from contaminated arable soil.

***Claim Rejections - 35 USC § 102/103***

Claims 6, 10 and 14-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Brown et al (Journal Of Environmental Quality, Vol. 23, pp. 1151-1157 (1994), Applicant's IDS). This rejection is repeated for the reasons of record as set forth in the last Office action of 09/14/04. Applicant's arguments have been considered but are not deemed persuasive.

Applicant argues that Brown et al used "prayon" type plant labeled as genotype G18 which had accumulated less than 300 mg/kg of Cd from arable soil as shown in the instant specification as originally filed, while the plants of the instant claims are of the genotype G15 which accumulated more than 15000 mg/kg of Cd. Applicant, therefore, asserts that the claimed invention is neither anticipated nor obvious over Brown et al.

These arguments are not persuasive because Brown et al do not teach that the *Thlaspi caerulescens* plants used in their study accumulated less 300 mg/kg of Cd, or if

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the plants used are "prayon" type or G18 genotype. The cited reference teaches accumulation of up to 18, 455 mg/kg of Zn and 1020 mg/Kg of Cd in dry wt basis in the shoot of *Thlaspi caerulescens* from three different soils including Zn/Cd contaminated farm soil. Therefore, it appears the plants used by Brown et al and the plants of the claimed invention are the same plants.

Applicant is invited to provide 132 declaration stating the prior art plants are not the same genotype as the G15 plants of the claimed invention.

### **Remarks**

No claim is allowed.

### **Contact Information**

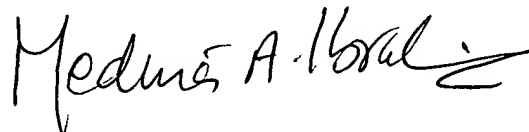
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Medina A. Ibrahim whose telephone number is (571) 272-0797. The Examiner can normally be reached Monday -Thursday from 8:00AM to 5:30PM and every other Friday from 9:00AM to 5:00 PM. Before and after final responses should be directed to fax nos. (703) 872-9306 and (703) 872-9307, respectively.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Amy Nelson, can be reached at (571) 272-0804.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

5/10/05

Mai



MEDINA A. IBRAHIM  
PATENT EXAMINER